Elsevier LaTeX template[☆]

Elsevier[1]

Radarweg 29, Amsterdam

Elsevier Inc[a,b], Global Customer Service[b,]*

[a]1600 John F Kennedy Boulevard, Philadelphia
[b]360 Park Avenue South, New York

Abstract

This template helps you to create a properly formatted LaTeX manuscript.

Keywords: `elsarticle.cls`, LaTeX, Elsevier, template

2010 MSC: 00-01, 99-00

1. Main

Suppose (X_1^T, Y_1),...,(X_n^T, Y_n) are i.i.d. from $N_{p+1}(\mu, \Sigma)$, where $X_i \in \mathbb{R}^p$ and $Y_i \in \mathbb{R}$. Denote $X = (X_1, \ldots, X_n)$, $Y = (Y_1, \ldots, Y_n)^T$.

Write $Y = \beta_0 \mathbf{1}_n + X^T\beta + \epsilon$, where $\mathbf{1}_n$ is n dimensional vector with all elements equal to 1. ϵ has distribution $N(0, \sigma^2 I_n)$.

The problem is to test hypotheses $H : \beta = 0$.

The test statistic is

$$T = \frac{(\mathbf{1}_n^T (X^T X)^{-1} Q_n Y)^2}{\hat{\sigma}^2 \mathbf{1}_n^T (X^T X)^{-1} Q_n (X^T X)^{-1} \mathbf{1}_n}.$$

where $Q_n = I_n - \frac{1}{n}\mathbf{1}_n\mathbf{1}_n^T$ and

$$\hat{\sigma}^2 = \frac{1}{n-2} Y^T Q_n \Big[I_n - \frac{(X^T X)^{-1}\mathbf{1}_n\mathbf{1}_n^T (X^T X)^{-1}}{\mathbf{1}_n^T (X^T X)^{-1} Q_n (X^T X)^{-1}\mathbf{1}_n} \Big] Q_n Y$$

[☆]Fully documented templates are available in the elsarticle package on CTAN.

[*]Corresponding author
Email address: `support@elsevier.com` (Global Customer Service)
URL: `www.elsevier.com` (Elsevier Inc)
[1]Since 1880.

n	p	$\|\beta\|^2$	Chen	New
40	310	0.00	0.05	0.04
40	310	0.02	0.15	0.32
40	310	0.04	0.37	0.57
40	310	0.06	0.24	0.48
80	550	0.00	0.05	0.06
80	550	0.02	0.12	0.33
80	550	0.04	0.16	0.47
80	550	0.06	0.65	0.86

Table 1: Non-sparse case, $T = 10$

n	p	$\|\beta\|^2$	Chen	New
40	310	0.00	0.05	0.05
40	310	0.02	0.69	0.60
40	310	0.04	0.97	0.86
40	310	0.06	1.00	0.92
80	550	0.00	0.05	0.04
80	550	0.02	0.99	0.96
80	550	0.04	1.00	1.00
80	550	0.06	1.00	1.00

Table 2: Non-sparse case, $T = 20$

References

n	p	$\|\beta\|^2$	Chen	New
40	310	0.00	0.05	0.05
40	310	0.02	0.05	0.09
40	310	0.04	0.06	0.08
40	310	0.06	0.08	0.08
80	550	0.00	0.05	0.07
80	550	0.02	0.06	0.04
80	550	0.04	0.06	0.06
80	550	0.06	0.13	0.10

Table 3: Sparse case, $T = 10$

n	p	$\|\beta\|^2$	Chen	New
40	310	0.00	0.05	0.01
40	310	0.02	0.07	0.09
40	310	0.04	0.09	0.08
40	310	0.06	0.18	0.09
80	550	0.00	0.05	0.04
80	550	0.02	0.11	0.07
80	550	0.04	0.25	0.12
80	550	0.06	0.37	0.14

Table 4: Sparse case, $T = 20$